CONTAINS NO CBI

EPA

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EPA-OTS

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90-890000 400

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comprehensive Assessment Information Rule

REPORTING FORM

When completed, send this form to:	For Agency Use Only:
Document Processing Center Office of Toxic Substances, TS-790 U.S. Environmental Protection Agency 401 M Street, SW Washington, DC 20460 Attention: CAIR Reporting Office	Date of Receipt: _____ Document Control Number: _____ Docket Number: _____

EPA Form 7710-52

SECTION 1 GENERAL MANUFACTURER, IMPORTER, AND PROCESSOR INFORMATION

PART A GENERAL REPORTING INFORMATION

1.01 This Comprehensive Assessment Information Rule (CAIR) Reporting Form has been completed in response to the Federal Register Notice of..... [1][2] [2][2] [8][8]
mo. day year

CBI

[ ] a. If a Chemical Abstracts Service Number (CAS No.) is provided in the Federal Register, list the CAS No. ..... [0][2][6][4][7][1]-[6][2]-[5]

b. If a chemical substance CAS No. is not provided in the Federal Register, list either (i) the chemical name, (ii) the mixture name, or (iii) the trade name of the chemical substance as provided in the Federal Register.

(i) Chemical name as listed in the rule ..... _____

(ii) Name of mixture as listed in the rule .... _____

(iii) Trade name as listed in the rule ..... _____

c. If a chemical category is provided in the Federal Register, report the name of the category as listed in the rule, the chemical substance CAS No. you are reporting on which falls under the listed category, and the chemical name of the substance you are reporting on which falls under the listed category.

Name of category as listed in the rule ..... _____

CAS No. of chemical substance ..... [ ][ ][ ][ ][ ][ ]-[ ][ ]-[ ]

Name of chemical substance ..... _____

1.02 Identify your reporting status under CAIR by circling the appropriate response(s).

CBI

Manufacturer 1

[ ] Importer 2

Processor ..... (3)

X/P manufacturer reporting for customer who is a processor 4

X/P processor reporting for customer who is a processor 5

[ ] Mark (X) this box if you attach a continuation sheet.

1.03 Does the substance you are reporting on have an "x/p" designation associated with it in the above-listed Federal Register Notice?

CBI

[ ]

Yes ..... [X] Go to question 1.04

No ..... [ ] Go to question 1.05

1.04 a. Do you manufacture, import, or process the listed substance and distribute it under a trade name(s) different than that listed in the Federal Register Notice? Circle the appropriate response.

CBI

[ ]

Yes 1

No ..... (2)

b. Check the appropriate box below:

[ ] You have chosen to notify your customers of their reporting obligations

Provide the trade name(s) .... _____

_____

[ ] You have chosen to report for your customers

[X] You have submitted the trade name(s) to EPA one day after the effective date of the rule in the Federal Register Notice under which you are reporting.

1.05 If you buy a trade name product and are reporting because you were notified of your reporting requirements by your trade name supplier, provide that trade name.

CBI

[ ]

Trade name ..... OLIN TDI-80

Is the trade name product a mixture? Circle the appropriate response.

Yes 1

No ..... (2)

1.06 Certification -- The person who is responsible for the completion of this form must sign the certification statement below:

CBI

[ ]

"I hereby certify that, to the best of my knowledge and belief, all information entered on this form is complete and accurate."

Ronald L. Siemon	[signature]	9/15/89
NAME	SIGNATURE	DATE SIGNED

Vice President	(312) 446-7500
TITLE	TELEPHONE NO.

[ ] Mark (X) this box if you attach a continuation sheet.

1.07 Exemptions From Reporting -- If you have provided EPA or another Federal agency with the required information on a CAIR Reporting Form for the listed substance within the past 3 years, and this information is current, accurate, and complete for the time period specified in the rule, then sign the certification below. You are required to complete section 1 of this CAIR form and provide any information now required but not previously submitted. Provide a copy of any previous submissions along with your Section 1 submission.

CBI

[__]

"I hereby certify that, to the best of my knowledge and belief, all required information which I have not included in this CAIR Reporting Form has been submitted to EPA within the past 3 years and is current, accurate, and complete for the time period specified in the rule."

N/A		
NAME	SIGNATURE	DATE SIGNED
TITLE	(_____) _____ - _____ TELEPHONE NO.	DATE OF PREVIOUS SUBMISSION

1.08 CBI Certification -- If you have asserted any CBI claims in this report you must certify that the following statements truthfully and accurately apply to all of those confidentiality claims which you have asserted.

CBI

[__]

"My company has taken measures to protect the confidentiality of the information, and it will continue to take these measures; the information is not, and has not been, reasonably ascertainable by other persons (other than government bodies) by using legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding) without my company's consent; the information is not publicly available elsewhere; and disclosure of the information would cause substantial harm to my company's competitive position."

N/A		
NAME	SIGNATURE	DATE SIGNED
TITLE	(_____) _____ - _____ TELEPHONE NO.	

[__] Mark (X) this box if you attach a continuation sheet.

PART B CORPORATE DATA

1.09 Facility Identification

CBI Name [S][T][E][P][A][N] [C][O][M][P][A][N][Y]

[ ] Address [R][.][R][.] [#][1]
Street

[E][L][W][O][O][D]
City

[I][L] [6][0][4][3][1]--[ ][ ][ ][ ]
State Zip

Dun & Bradstreet Number .....[0][5]-[4][3][5]-[1][7][7][0]

EPA ID Number .....[0][5][4][3][5][1][7][7][0]

Employer ID Number ....N/A.....[ ][ ][ ][ ][ ][ ][ ][ ]

Primary Standard Industrial Classification (SIC) Code .....[3][0][8][6]

Other SIC Code ....N/A.....[ ][ ][ ][ ]

Other SIC Code ....N/A.....[ ][ ][ ][ ]

1.10 Company Headquarters Identification

CBI Name [S][T][E][P][A][N] [C][O][M][P][A][N][Y]

[ ] Address [2][2] [W][.] [F][R][O][N][T] [A][G][E] [R][O][A][D]
Street

[N][O][R][T][H][F][I][E][L][D]
City

[I][L] [6][0][0][9][3]--[ ][ ][ ][ ]
State Zip

Dun & Bradstreet Number .....[0][0]-[5][1][3]-[0][1][8][2]

Employer ID Number .....[3][6][1][8][2][3][8][3][4]

[ ] Mark (X) this box if you attach a continuation sheet.

1.11 Parent Company Identification N/A

CBI Name [_]

[_] Address [_]
Street

[_]
City

[_][_] [_][_][_][_][_]--[_][_][_][_]
State Zip

Dun & Bradstreet Number ....[_][_]-[_][_][_]-[_][_][_][_]

1.12 Technical Contact

CBI Name [T][H][O][M][A][S][_][C][A][S][S][I][D][Y]

[_] Title [M][A][N][A][G][E][R][_][P][O][L][Y][U][R][E][T][H][A][N][E][_][K][I][T]

Address [2][2][_][W][.][_][F][R][O][N][T][A][G][E][_][R][O][A][D]
Street

[N][O][R][T][F][I][E][L][D]
City

[I][L] [6][0][0][9][3]--[_][_][_][_]
State Zip

Telephone Number ....[3][1][2]-[4][4][6]-[7][5][0][0]

1.13 This reporting year is from .... [0][1] [8][8] to [1][2] [8][8]
Mo. Year Mo. Year

[_] Mark (X) this box if you attach a continuation sheet.

1.14 Facility Acquired -- If you purchased this facility during the reporting year, provide the following information about the seller: N/A

CBI Name of Seller [__]

[__] Mailing Address [__]
Street

[__]
City

[__][__] [__][__][__][__][__]--[__][__][__][__]
State Zip

Employer ID Number .....[__][__]-[__][__][__][__][__][__][__]

Date of Sale .....[__][__] [__][__] [__][__]
Mo. Day Year

Contact Person [__]

Telephone Number .....[__][__][__]-[__][__][__]-[__][__][__][__]

1.15 Facility Sold -- If you sold this facility during the reporting year, provide the following information about the buyer: N/A

CBI Name of Buyer [__]

[__] Mailing Address [__]
Street

[__]
City

[__][__] [__][__][__][__][__]--[__][__][__][__]
State Zip

Employer ID Number .....[__][__]-[__][__][__][__][__][__][__]

Date of Purchase .....[__][__] [__][__] [__][__]
Mo. Day Year

Contact Person [__]

Telephone Number .....[__][__][__]-[__][__][__]-[__][__][__][__]

[__] Mark (X) this box if you attach a continuation sheet.

1.16 For each classification listed below, state the quantity of the listed substance that was manufactured, imported, or processed at your facility during the reporting year.

CBI
[ ]

Classification	Quantity (kg/yr)
Manufactured	
Imported	
Processed (include quantity repackaged)	31,009
Of that quantity manufactured or imported, report that quantity:	
In storage at the beginning of the reporting year	N/A
For on-site use or processing	N/A
For direct commercial distribution (including export)	N/A
In storage at the end of the reporting year	N/A
Of that quantity processed, report that quantity:	
① In storage at the beginning of the reporting year	UK
Processed as a reactant (chemical producer)	19993
Processed as a formulation component (mixture producer)	N/A
Processed as an article component (article producer)	N/A
Repackaged (including export)	N/A
① In storage at the end of the reporting year	UK

① INVENTORY NOT TAKEN AT BEGINNING OR END OF REPORTING YEAR.

[ ] Mark (X) this box if you attach a continuation sheet.

PART C IDENTIFICATION OF MIXTURES

1.17 Mixture -- If the listed substance on which you are required to report is a mixture or a component of a mixture, provide the following information for each component chemical. (If the mixture composition is variable, report an average percentage of each component chemical for all formulations.) N/A

CBI

[ ]

Component Name	Supplier Name	Average % Composition by Weight (specify precision, e.g., 45% ± 0.5%)
	Total	100%

[ ] Mark (X) this box if you attach a continuation sheet.

2.04 State the quantity of the listed substance that your facility manufactured, imported, or processed during the 3 corporate fiscal years preceding the reporting year in descending order.

CBI

[ ] Year ending ..... [1][2] Mo. [8][7] Year

Quantity manufactured ..... _____ kg

Quantity imported ..... _____ kg

Quantity processed ..... 28353 kg

Year ending ..... [1][2] Mo. [8][6] Year

Quantity manufactured ..... _____ kg

Quantity imported ..... _____ kg

Quantity processed ..... 103172 kg

Year ending ..... [1][2] Mo. [8][5] Year

Quantity manufactured ..... _____ kg

Quantity imported ..... _____ kg

Quantity processed ..... 126844 kg

2.05 Specify the manner in which you manufactured the listed substance. Circle all appropriate process types. N/A

CBI

[ ]

Continuous process 1

Semicontinuous process 2

Batch process 3

[ ] Mark (X) this box if you attach a continuation sheet.

2.06 Specify the manner in which you processed the listed substance. Circle all
CBI appropriate process types.

[ ]

Continuous process 1

Semicontinuous process 2

Batch process ..... (3)

2.07 State your facility's name-plate capacity for manufacturing or processing the listed substance. (If you are a batch manufacturer or batch processor, do not answer this
CBI question.)

[ ]

Manufacturing capacity ..... _____ kg/yr

Processing capacity ..... N/A kg/yr

2.08 If you intend to increase or decrease the quantity of the listed substance manufactured, imported, or processed at any time after your current corporate fiscal year, estimate the increase or decrease based upon the reporting year's production
CBI volume.

[ ]

	Manufacturing Quantity (kg)	Importing Quantity (kg)	Processing Quantity (kg)
Amount of increase			N/A
Amount of decrease			N/A

[ ] Mark (X) this box if you attach a continuation sheet.

2.09 For the three largest volume manufacturing or processing process types involving the listed substance, specify the number of days you manufactured or processed the listed substance during the reporting year. Also specify the average number of hours per day each process type was operated. (If only one or two operations are involved, list those.)

CBI

[ ]

	Days/Year	Average Hours/Day
Process Type #1 (The process type involving the largest quantity of the listed substance.)		
Manufactured		
Processed	16	24
Process Type #2 (The process type involving the 2nd largest quantity of the listed substance.)		
Manufactured		
Processed		
Process Type #3 (The process type involving the 3rd largest quantity of the listed substance.)		
Manufactured		
Processed		

✓ 2.10 State the maximum daily inventory and average monthly inventory of the listed substance that was stored on-site during the reporting year in the form of a bulk chemical.

CBI

[ ]

Maximum daily inventory		kg
Average monthly inventory		kg

[ ] Mark (X) this box if you attach a continuation sheet.

2.11 Related Product Types -- List any byproducts, coproducts, or impurities present with the listed substance in concentrations greater than 0.1 percent as it is manufactured, imported, or processed. The source of byproducts, coproducts, or impurities means the source from which the byproducts, coproducts, or impurities are made or introduced into the product (e.g., carryover from raw material, reaction product, etc.).

CBI

[ ] N/A

CAS No.	Chemical Name	Byproduct, Coproduct or Impurity[1]	Concentration (%) (specify ± % precision)	Source of Byproducts, Coproducts, or Impurities

[1]Use the following codes to designate byproduct, coproduct, or impurity:

B = Byproduct
C = Coproduct
I = Impurity

[ ] Mark (X) this box if you attach a continuation sheet.

2.12 Existing Product Types -- List all existing product types which you manufactured, imported, or processed using the listed substance during the reporting year. List the quantity of listed substance you use for each product type as a percentage of the total volume of listed substance used during the reporting year. Also list the CBI quantity of listed substance used captively on-site as a percentage of the value [ ] listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	35	0	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.13 Expected Product Types -- Identify all product types which you expect to manufacture, import, or process using the listed substance at any time after your current corporate fiscal year. For each use, specify the quantity you expect to manufacture, import, or process for each use as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI

[ ]

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	35	0	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.14 CBI [ ] Final Product -- Complete the following table for each type of final product manufactured, imported, or processed at your facility that contains the listed substance other than as an impurity.

a. Product Type[1]	b. Final Product's Physical Form[2]	c. Average % Composition of Listed Substance in Final Product	d. Type of End-Users[3]
B	B	66	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the final product's physical form:

A = Gas
B = Liquid
C = Aqueous solution
D = Paste
E = Slurry
F1 = Powder
F2 = Crystalline solid
F3 = Granules
F4 = Other solid
G = Gel
H = Other (specify) _____

[3]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.15 Circle all applicable modes of transportation used to deliver bulk shipments of the
CBI listed substance to off-site customers. N/A

[ ] Truck 1

Railcar 2

Barge, Vessel 3

Pipeline 4

Plane 5

Other (specify) _____ 6

2.16 Customer Use -- Estimate the quantity of the listed substance used by your customers or prepared by your customers during the reporting year for use under each category
CBI of end use listed (i-iv).

[ ]

Category of End Use

i. Industrial Products

Chemical or mixture ..... 19993 kg/yr

Article ..... _____ kg/yr

ii. Commercial Products

Chemical or mixture ..... _____ kg/yr

Article ..... _____ kg/yr

iii. Consumer Products

Chemical or mixture ..... _____ kg/yr

Article ..... _____ kg/yr

iv. Other

Distribution (excluding export) ..... _____ kg/yr

Export ..... _____ kg/yr

Quantity of substance consumed as reactant ..... _____ kg/yr

Unknown customer uses ..... _____ kg/yr

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 3 PROCESSOR RAW MATERIAL IDENTIFICATION

PART A GENERAL DATA

3.01 Specify the quantity purchased and the average price paid for the listed substance for each major source of supply listed. Product trades are treated as purchases.
CBI The average price is the market value of the product that was traded for the listed substance.
[ ]

Source of Supply	Quantity (kg)	Average Price ($/kg)
The listed substance was manufactured on-site.		
The listed substance was transferred from a different company site.		
The listed substance was purchased directly from a manufacturer or importer.	27215	$2.65
The listed substance was purchased from a distributor or repackager.		
The listed substance was purchased from a mixture producer.		

3.02 Circle all applicable modes of transportation used to deliver the listed substance to your facility.
CBI
[ ]

Truck ..... (1)
Railcar 2
Barge, Vessel 3
Pipeline 4
Plane 5
Other (specify) _____ 6

[ ] Mark (X) this box if you attach a continuation sheet.

3.03 CBI a. Circle all applicable containers used to transport the listed substance to your facility.

[ ]

Bags 1

Boxes 2

Free standing tank cylinders 3

Tank rail cars 4

Hopper cars 5

Tank trucks 6

Hopper trucks 7

Drums ..... (8)

Pipeline 9

Other (specify) _____ 10

b. If the listed substance is transported in pressurized tank cylinders, tank rail cars, or tank trucks, state the pressure of the tanks.

Tank cylinders ..... _____ mmHg

Tank rail cars ..... _____ mmHg

Tank trucks ..... _____ mmHg

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RAW MATERIAL IN THE FORM OF A MIXTURE

3.04 If you obtain the listed substance in the form of a mixture, list the trade name(s) of the mixture, the name of its supplier(s) or manufacturer(s), an estimate of the average percent composition by weight of the listed substance in the mixture, and the amount of mixture processed during the reporting year. N/A

CBI

[ ]

Trade Name	Supplier or Manufacturer	Average % Composition by Weight (specify ± % precision)	Amount Processed (kg/yr)

[ ] Mark (X) this box if you attach a continuation sheet.

PART C RAW MATERIAL VOLUME

3.05 CBI [ ] State the quantity of the listed substance used as a raw material during the reporting year in the form of a class I chemical, class II chemical, or polymer, and the percent composition, by weight, of the listed substance.

	Quantity Used (kg/yr)	% Composition by Weight of Listed Substance in Raw Material (specify ± % precision)
Class I chemical	31009	98±1
Class II chemical		
Polymer		

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 4 PHYSICAL/CHEMICAL PROPERTIES

General Instructions:

If you are reporting on a mixture as defined in the glossary, reply to questions in Section 4 that are inappropriate to mixtures by stating "NA -- mixture."

For questions 4.06-4.15, if you possess any hazard warning statement, label, MSDS, or other notice that addresses the information requested, you may submit a copy or reasonable facsimile in lieu of answering those questions which it addresses.

PART A PHYSICAL/CHEMICAL DATA SUMMARY

4.01 Specify the percent purity for the three major[1] technical grade(s) of the listed substance as it is manufactured, imported, or processed. Measure the purity of the substance in the final product form for manufacturing activities, at the time you import the substance, or at the point you begin to process the substance.

CBI

[ ]

	Manufacture	Import	Process
Technical grade #1	_____% purity	_____% purity	98+ % purity
Technical grade #2	_____% purity	_____% purity	_____% purity
Technical grade #3	_____% purity	_____% purity	_____% purity

[1]Major = Greatest quantity of listed substance manufactured, imported or processed.

4.02 Submit your most recently updated Material Safety Data Sheet (MSDS) for the listed substance, and for every formulation containing the listed substance. If you possess an MSDS that you developed and an MSDS developed by a different source, submit your version. Indicate whether at least one MSDS has been submitted by circling the appropriate response.

Yes ..... (1)

No 2

Indicate whether the MSDS was developed by your company or by a different source.

Your company 1

Another source ..... (2)

[ ] Mark (X) this box if you attach a continuation sheet.

Olin MATERIAL SAFETY DATA

OCEAN® Network
EMERGENCY PHONE 1-800-OLIN-911

SECTION I - IDENTIFICATION

MSDS FILE 563

CHEMICAL NAME & SYNONYMS Toluene Diisocyanate 80-20		
CHEMICAL FAMILY Isocyanate	FORMULA $C_9H_6N_2O_2$	PRODUCT TDI 80-20
DESCRIPTION Clear colorless to pale yellow liquid with sharp pungent odor		CAS NO. 26471-62-5

SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Do not take internally. Do not get in eyes, on skin or clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor. Protect against physical damage. Store in a cool, dry, well-ventilated place, away from areas where a fire hazard may be acute. Outside or detached storage is preferred. Blanket storage tanks with inert gas (nitrogen) or dry air. Separate from oxidizing materials.

PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
EYES Goggles GLOVES Rubber, NBR or PVA OTHER Coveralls, impervious footwear	As required to keep airborne concentrations below TLV

SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	OSHA PEL	LD50	LC50	SIGNIFICANT EFFECTS
Toluene-2,4-diisocyanate	0.02 ppm ceiling	5.8 g/kg (rat)	10 ppm/4 hrs (mouse) (mouse)	Skin, eye, mucous membrane irritation. Pulmonary irritant. Allergic sensitization to skin and respiratory tract. May cause asthma attacks.
Toluene-2,6-diisocyanate	None established	No data	11 ppm/4 hrs-mouse	Irritation

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 270°F COC METHOD	OSHA CLASSIFICATION Not Regulated (Ignitable)	FLAMMABLE EXPLOSIVE LIMIT	LOWER	UPPER
			0.9%	9.5%

EXTINGUISHING MEDIA Water, carbon dioxide or dry chemical. Use water to keep the exposed containers cool.

SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Water spray should be used to cool fire exposed containers and/or to disperse unignited vapors. Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus when any material is involved in a fire.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
0.005 ppm TWA, 0.02 ppm STEL - 2,4 TDI (ACGIH 1986-87)

SYMPTOMS OF OVER EXPOSURE May cause irritation to eyes, throat, lungs, stomach, skin. Allergic sensitization to skin and respiratory tract. May cause asthma attacks

EMERGENCY FIRST-AID PROCEDURES

SKIN Immediately flush thoroughly with water for 15 minutes. Call a physician.

EYES Immediately flush thoroughly with water for 15 minutes. Call a physician.

INGESTION Immediately drink water to dilute.

PRODUCT CODE 898864 CHEMICAL NAME TDI 80-20

SECTION VI - TOXICOLOGY (PRODUCT)

ACUTE ORAL LD 50
5.8 g/kg (rats)
ACUTE DERMAL LD 50
> 2 g/kg (rabbits)
ACUTE INHALATION LC 50
10 ppm/4 hrs (mouse)

CARCINOGENICITY Oral Exposure-Positive NTP Bioassay
MUTAGENICITY Not known to be mutagenic
EYE IRRITATION Irritation and/or burns
PRIMARY SKIN IRRITATION
Irritation and/or burns

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, dermal

EFFECTS OF ACUTE EXPOSURE May cause irritation to lungs, eyes, throat, stomach, skin. Allergic sensitization of skin and respiratory tract. Corneal injury may occur.

EFFECTS OF CHRONIC EXPOSURE Damage/allergic sensitization to lungs. Inhalation studies indicate not carcinogenic. Carcinogenic risk from industrial use is not significant.

SECTION VII - SPILL AND LEAKAGE PROCEDURES (CONTROL PROCEDURES)

ACTION FOR MATERIAL RELEASE OR SPILL
Wear NIOSH/MSHA approved positive pressure supplied air respirator. Follow OSHA regulations for respirator use (see 29 CFR 1910.134). Wear goggles, coveralls and impervious gloves and boots. Add dry non-combustible absorbent, sweep up material and place in an approved DOT container. Add an equal amount of neutralizing solution to the container (90-95% water, 5-10% ammonia). Clean remaining surfaces with neutralizing solution and add this to container. Isolate container in a well-ventilated place and do not seal for 24 hrs. Ammonia vapors may be generated until solution is neutralized. Wash all contaminated clothing before reuse. In the event of a large spill use the telephone number shown on the front of this sheet.

TRANSPORTATION EMERGENCY, CONTACT CHEMTREC 800-424-9300

WASTE DISPOSAL METHOD

Dispose of contaminated product, empty containers and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate Federal, State and local regulatory agencies to ascertain proper disposal procedures.

SECTION VIII - SHIPPING DATA

D.O.T.	Toluene diisocyanate Poison B UN 2078

SECTION IX - REACTIVITY DATA

STABLE X UNSTABLE AT____C ____ F	HAZARDOUS POLYMERIZATION	MAY OCCUR	X
		WILL NOT OCCUR	

CONDITIONS TO AVOID
Water or incompatible materials in a closed system, excess heat
INCOMPATIBILITY(MATERIAL TO AVOID)
Acids, bases and alcohols, surface active materials
HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, nitrogen oxides, hydrogen cyanide

SECTION X - PHYSICAL DATA

MELTING POINT 53-56°F	VAPOR PRESSURE .01mmHg, 20°C	VOLATILES No data
BOILING POINT 484°F	SOLUBILITY IN WATER Insoluble	EVAPORATION RATE No data
SPECIFIC GRAVITY(H2O=1) 1.22	PH No data	VAPOR DENSITY(AIR=1) 6.0

INFORMATION: FURNISHED TO FURNISHED BY DATE JUNE 19, 1987

Department of Environmental Hygiene and Toxicology
(203) 789-5436

Olin CORPORATION
120 Long Ridge Road, Stamford, Connecticut 06904
OCEAN® Network
EMERGENCY PHONE 1-800-OLIN-911

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188660 PRODUCT NAME: STEPANFOAM KA8866

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188660 PRODUCT NAME: STEPANFOAM KA8866
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 23%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 6%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *
(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
****

****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

****

NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188650 PRODUCT NAME: STEPANFOAM KA8865

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188650 PRODUCT NAME: STEPANFOAM KA8865
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 25%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 6%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
9.5 LBS.

SECTION IV: FIRE AND EXPLOSION DATA

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

SECTION V: REACTIVITY DATA

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

SECTION VI: HEALTH HAZARD DATA

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
****

****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

********** LAST REVISION DATE: 03/09/89 09:49:29 **********

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188610 PRODUCT NAME: STEPANFOAM KA8861

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188610 PRODUCT NAME: STEPANFOAM KA8861
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 64%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

BOILING POINT:

(CONTINUED)

OVER 200 DEG F. (93 DEG C.).

% VOLATILE BY WEIGHT:
NIL

EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.

WEIGHT PER GALLON:
10.2 LBS.

SECTION IV: FIRE AND EXPLOSION DATA

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).

EXPLOSIVE LIMITS:
LOWER:
1%

EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.

SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

SECTION V: REACTIVITY DATA

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).

HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

SECTION VI: HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES
(CONTINUED)

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
****

SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.

LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.

(CONTINUED)

WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.
1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

(CONTINUED)

NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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****

(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188600 PRODUCT NAME: STEPANFOAM KA8860

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188600 PRODUCT NAME: STEPANFOAM KA8860
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 44%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 11%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188590 PRODUCT NAME: STEPANFOAM KA8859

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188590 PRODUCT NAME: STEPANFOAM KA8859
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 51%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 13%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

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* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

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EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188580 PRODUCT NAME: STEPANFOAM KA8858

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188580 PRODUCT NAME: STEPANFOAM KA8858
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 8%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 5%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

SECTION IV: FIRE AND EXPLOSION DATA

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

SECTION V: REACTIVITY DATA

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

SECTION VI: HEALTH HAZARD DATA

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188570 PRODUCT NAME: STEPANFOAM KA8857

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188570 PRODUCT NAME: STEPANFOAM KA8857
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 17%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 4%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

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* SECTION IV: FIRE AND EXPLOSION DATA *
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FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *
(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188550 PRODUCT NAME: STEPANFOAM KA8855

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188550 PRODUCT NAME: STEPANFOAM KA8855
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 16%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 4%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

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* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

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EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188540 PRODUCT NAME: STEPANFOAM KA8854

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188540 PRODUCT NAME: STEPANFOAM KA8854
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 16%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 4%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 212 DEG F. (100 DEG C.).
% VOLATILE BY WEIGHT:
1%
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED LIGHTER THAN AIR.
VAPOR PRESSURE (MM HG):
NOT DETERMINED OR UNKNOWN.
WEIGHT PER GALLON:
9.2 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (PENSKY-MARTENS CLOSED CUP):
OVER 230 DEG F. (110 DEG C.).
EXPLOSIVE LIMITS:
LOWER: NOT DETERMINED. UPPER: NOT DETERMINED.
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
HAZARDOUS DECOMPOSITION PRODUCTS:
NONE KNOWN.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.

CARCINOGEN: THIS PRODUCT IS NOT CONSIDERED A CARCINOGEN BY OSHA, NTP, OR IARC.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.

LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.

WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS

(CONTINUED)

PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE ADEQUATE VENTILATION.

OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
STORE IN A DRY, WELL VENTILATED AREA AT ABOUT 65 - 75 DEG. F. (18 - 25 DEG. C).
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

(CONTINUED)

THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188530 PRODUCT NAME: STEPANFOAM KA8853

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188530 PRODUCT NAME: STEPANFOAM KA8853
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 15%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 4%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.1 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *
(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.

THRESHOLD LIMIT VALUE:
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.

(CONTINUED)

VENTILATE AREA.
SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

(CONTINUED)

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.
1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

****

NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188520 PRODUCT NAME: STEPANFOAM KA8852

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188520 PRODUCT NAME: STEPANFOAM KA8852
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 38%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 10%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

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* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
****

****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89 PAGE: 1

PRODUCT NUMBER: 188510 PRODUCT NAME: STEPANFOAM KA8851

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188510 PRODUCT NAME: STEPANFOAM KA8851
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 39%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 10%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
9.6 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER: NOT APPLICABLE. UPPER: NOT APPLICABLE.
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *
****

(CONTINUED)

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER,

(CONTINUED)

FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.
1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

(CONTINUED)

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188480 PRODUCT NAME: STEPANFOAM KA8848

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188480 PRODUCT NAME: STEPANFOAM KA8848
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 51%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 13%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTINC PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188470 PRODUCT NAME: STEPANFOAM KA8847

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188470 PRODUCT NAME: STEPANFOAM KA8847
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 74%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 18%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

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* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

********** LAST REVISION DATE: 03/09/89 09:49:29 **********

MATERIAL SAFETY DATA SHEET

PRODUCT NUMBER: 188460 PRODUCT NAME: STEPANFOAM KA8846

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188460 PRODUCT NAME: STEPANFOAM KA8846
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 77%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 19%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.2 LBS.

SECTION IV: FIRE AND EXPLOSION DATA

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

SECTION V: REACTIVITY DATA

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

SECTION VI: HEALTH HAZARD DATA

(CONTINUED)

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EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

****

NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89 PAGE: 1

PRODUCT NUMBER: 188430 PRODUCT NAME: STEPANFOAM KA8843

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STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

****

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188430 PRODUCT NAME: STEPANFOAM KA8843
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 47%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 12%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.2 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.

THRESHOLD LIMIT VALUE:
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

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FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.

(CONTINUED)

VENTILATE AREA.
SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

(CONTINUED)

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.
1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

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NEITHER THIS DATA SHEET NOR ANY STATEMENT CONTAINED HEREIN GRANTS OR EXTENDS ANY LICENSE, EXPRESS OR IMPLIED, IN CONNECTION WITH PATENTS ISSUED OR PENDING WHICH MAY BE THE PROPERTY OF THE MANUFACTURER OR OTHERS. THE INFORMATION IN THIS DATA SHEET HAS BEEN ASSEMBLED BY THE MANUFACTURER BASED ON ITS OWN STUDIES AND ON THE WORK OF OTHERS. THE MANUFACTURER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, OR ADEQUACY OF THE INFORMATION CONTAINED HEREIN. THE MANUFACTURER SHALL NOT BE LIABLE (REGARDLESS OF FAULT) TO THE VENDEE, THE VENDEE'S EMPLOYEES, OR ANYONE FOR ANY DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE ACCURACY, COMPLETENESS, ADEQUACY, OR FURNISHING OF SUCH INFORMATION.

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188210 PRODUCT NAME: STEPANFOAM KA8821

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188210 PRODUCT NAME: STEPANFOAM KA8821
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: POISON.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 50%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 12%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

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BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.0 LBS.

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* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
****

****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

****

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(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

MATERIAL SAFETY DATA SHEET

DATE: 06/29/89

PRODUCT NUMBER: 188120 PRODUCT NAME: STEPANFOAM KA8812

STEPAN COMPANY
NORTHFIELD, IL. 60093
(312) 446-7500

EMERGENCY INFORMATION
MEDICAL: 1-800-228-5635
CHEMTREC: 1-800-424-9300

SECTION I: GENERAL INFORMATION

PRODUCT NUMBER: 188120 PRODUCT NAME: STEPANFOAM KA8812
PRODUCT CLASS: TOLUENE DIISOCYANATE.
PRECAUTIONS: CAUSES IRRITATION.
REFER TO BILL OF LADING OR CONTAINER LABEL FOR DOT OR OTHER TRANSPORTATION HAZARD CLASSIFICATION, IF ANY.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
TOLUENE-2,4-DIISOCYANATE (TDI) (C) (584-84-9) 19%	0.005	0.005	SARA 313
TOLUENE-2,6-DIISOCYANATE (TDI) (C) (91-08-7) 5%	0.005	0.005	SARA 313

NE = NOT ESTABLISHED.
NL = NOT LISTED.
(C) = IDENTIFIED AS A CARCINOGEN BY OSHA, IARC, OR NTP.

SECTION III: PHYSICAL/CHEMICAL DATA

(CONTINUED)

****

BOILING POINT:
OVER 200 DEG F. (93 DEG C.).
% VOLATILE BY WEIGHT:
NIL
EVAPORATION RATE: ESTIMATED SLOWER THAN ETHYL ETHER.

VAPOR DENSITY: ESTIMATED HEAVIER THAN AIR.
WEIGHT PER GALLON:
10.1 LBS.

****
* SECTION IV: FIRE AND EXPLOSION DATA *
****

FLASH POINT (SETA FLASH CLOSED CUP):
OVER 200 DEG F. (93 DEG C.).
EXPLOSIVE LIMITS:
LOWER:
1%
EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM, OR WATER FOG. CLASS BC, ABC FIRE EXTINGUISHER.
SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

****
* SECTION V: REACTIVITY DATA *
****

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATABILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS
WATER, ALCOHOLS, AMINES, ALKALIES, METAL COMPOUNDS (CATALYSTS).
HAZARDOUS DECOMPOSITION PRODUCTS:
CYANIDES AND AMMONIA MAY BE FORMED.

****
* SECTION VI: HEALTH HAZARD DATA *

(CONTINUED)

****

EFFECTS OF OVEREXPOSURE/EMERGENCY AND FIRST AID PROCEDURES

EYES: CONTACT WITH EYES IS PAINFUL AND IRRITATING.
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SKIN: PROLONGED OR REPEATED CONTACT WITH SKIN CAUSES IRRITATION.
WASH OFF SKIN WITH WATER. REMOVE CONTAMINATED CLOTHING AND CLEAN BEFORE REUSE.

INHALATION: MIST CAUSED BY MANUFACTURING OPERATIONS IRRITATES NASAL PASSAGES.
IF VAPORS OR MIST CAUSE IRRITATION OR DISTRESS, REMOVE TO FRESH AIR.
GIVE OXYGEN OR APPLY ARTIFICIAL RESPIRATION, IF NEEDED.

INGESTION: IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVER-EXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED.
UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY CHEMICAL SHOULD BE AVOIDED.

IF ANY SYMPTOMS PERSIST, CONSULT A PHYSICIAN.
IN A NATIONAL TOXICOLOGY PROGRAM (NTP) STUDY, TDI WAS CARCINOGENIC WHEN GIVEN ORALLY TO RATS AND MICE AT MAXIMUM TOLERATED DOSES. TDI WAS NOT CARCINOGENIC TO RATS IN A TWO-YEAR INHALATION STUDY.
SEE SECTION II FOR HAZARDOUS INGREDIENTS PRESENT IN THIS PRODUCT AND THEIR CORRESPONDING THRESHOLD LIMIT VALUES.

****
FOR ADDITIONAL MEDICAL INFORMATION, CALL 1-800-228-5635
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****
* SECTION VII: SPILL, LEAK, AND DISPOSAL PROCEDURES *
****

CONTAIN ALL SPILLS AND LEAKS TO PREVENT DISCHARGE INTO THE ENVIRONMENT.
VENTILATE AREA.

(CONTINUED)

SMALL SPILLS: SOAK UP WITH ABSORBANT, SHOVEL INTO WASTE CONTAINER, FLUSH AREA WITH WATER.
LARGE SPILLS: RECOVER LIQUID FOR REPROCESSING OR DISPOSAL.
WASTE DISPOSAL: RECOVER MATERIAL OR DISPOSE (INCINERATION IS PREFERRED) IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. MATERIAL COLLECTED WITH ABSORBANT MAY BE DISPOSED IN A PERMITTED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. EMPTY CONTAINER MAY RETAIN VAPOR OR PRODUCT RESIDUE. OBSERVE ALL LABELED SAFEGUARDS UNTIL CONTAINER IS CLEANED, RECONDITIONED, OR DESTROYED.

SECTION VIII: PROTECTIVE MEASURES

EYE PROTECTION: WEAR FULL FACE SHIELD OR GOGGLES WHEN HANDLING.
PROTECTIVE GLOVES: USE IMPERVIOUS GLOVES.
RESPIRATORY PROTECTION:
IF VAPORS ARE PRESENT, USE NIOSH OR MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS, AIR-LINE RESPIRATOR, OR A SELF-CONTAINED BREATHING APPARATUS.
VENTILATION:
USE VENTILATION ADEQUATE TO KEEP HAZARDOUS INGREDIENTS BELOW THEIR TLV (SEE SECTION II).
OTHER PROTECTIVE EQUIPMENT:
WEAR PROTECTIVE CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR WORK AREA.

SECTION IX: SPECIAL PRECAUTIONS

HANDLING AND STORAGE:
AVOID OVERHEATING OR FREEZING.
AVOID OPEN FIRE OR FLAME.
OTHER PRECAUTIONS:
SPILLED MATERIAL IS SLIPPERY. WASH THOROUGHLY AFTER HANDLING. IF INGESTED, CALL A PHYSICIAN.

DO NOT POUR INTO DRAINS, AS SOLIDS THAT FORM WILL PLUG SEWERS.

(CONTINUED)

1% AMMONIA MAY BE USED TO NEUTRALIZE SPILLS.

****

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****
****

(R) REGISTERED TRADEMARK OR APPLICATION PENDING.

4.03 Submit a copy or reasonable facsimile of any hazard information (other than an MSDS) that is provided to your customers/users regarding the listed substance or any formulation containing the listed substance. Indicate whether this information has been submitted by circling the appropriate response.

(Yes) 1

No 2

4.04 For each activity that uses the listed substance, circle all the applicable number(s) corresponding to each physical state of the listed substance during the activity listed. Physical states for importing and processing activities are determined at the time you import or begin to process the listed substance. Physical states for manufacturing, storage, disposal and transport activities are determined using the final state of the product.

CBI

[ ]

	Physical State				
Activity	Solid	Slurry	Liquid	Liquified Gas	Gas
Manufacture	1	2	3	4	5
Import	1	2	3	4	5
Process	1	2	(3)	4	5
Store	1	2	3	4	5
Dispose	1	2	3	4	5
Transport	1	2	3	4	5

[ ] Mark (X) this box if you attach a continuation sheet.

SAFETY INFORMATION

Stepan

STEPANFOAM® ISOCYANATE AND RESIN COMPONENTS

Misuse of These Materials Can Be Hazardous! Please Read!

UNDERSTAND THE RISKS • LEARN TO AVOID THEM

KNOW WHAT TO DO IN AN EMERGENCY

Some degree of risk exists in the use—or more specifically, the misuse—of most industrial chemicals. This is true of the chemicals, particularly the isocyanates, used in making polyurethane and/or polyisocyanurate plastic products. However, recognition of potential risks, application of safety precautions, proper conditions of use and application, and good housekeeping practices permit these chemicals to be handled and used with no apparent harmful effects or unreasonable risks.

POTENTIAL RISKS

Potential risks associated with the use of STEPANFOAM components include sensitization, respiratory and eye irritation from vapor, and skin irritation from liquid. These risks arise from inadequate ventilation, spills, improper storage, improper disposal of containers and waste, and poor housekeeping.

RISKS FROM VAPOR AND MIST

The most common risk associated with the use of STEPANFOAM components arises from inhalation of vapors or mist generated during pouring, frothing or spraying operations.

Continued inhalation of isocyanate vapors or sprayfoam mists can cause nausea, headache, coughing, irritation of the nose and throat, shortness of breath and chest discomfort. Massive exposure, as in large spills, can cause severe coughing spasms, bronchitis, bronchial spasm and chemical pneumonitis. Some people can become sensitized to isocyanates and may suffer asthma-like attacks and respiratory distress when subsequently exposed to very low concentrations.

Inhalation of amine catalysts sometimes contained in the polyol resin component can irritate the nose, throat and lungs and can lead to sensitization.

Inhalation of high concentrations of halocarbon blowing agent vapor can cause loss of feeling and unconsciousness. If halocarbon vapors are inhaled through a lit cigarette, severe irritation of the nose, throat and lungs can result.

PRECAUTIONS AGAINST RISKS FROM VAPOR AND MIST

- Do not allow any vapor concentrations to exceed the threshold limit values (TLV) or maximum allowable concentrations (MAC) (0.02 ppm for isocyanates) established by OSHA. If you can smell isocyanate (pungent, irritating odor) or if your nose or eyes are irritated, the MAC has been exceeded and a hazardous condition exists.
- Concentration limits established by OSHA are only guides. You may be exposed to a combination of vapors during pouring, frothing or spraying operations, and such combinations can be more hazardous than the individual vapors alone.
- Measure vapor concentration with equipment designed for the purpose. Do not rely on your sense of smell.
- Conduct indoor casting or foaming operations in mechanically ventilated areas specifically reserved for such operations. If mechanical ventilation is impractical, wear a positive-pressure air-supplied mask or hood. For brief exposure, a chemical cartridge respirator may be satisfactory.
- Wear a positive-pressure air-supplied mask or hood during all sprayfoam applications, either indoors or outdoors. Spraying polyurethane or polyisocyanurate foam can produce hazardous concentrations of vapor and mist. The particulate mist produced can clog chemical cartridge respirators.
- Do not smoke or use open flames or space heaters during or near foaming operations.

LIQUID CONTACT RISKS

Liquid isocyanates splashed in the eye(s) can cause severe irritation, inflammation and/or damage to sensitive eye tissue.

Skin contact with liquid isocyanates can cause reddening, irritation, dermatitis and, in some individuals, sensitization.

Ingestion of isocyanates can cause irritation of and possibly corrosive action on mouth and stomach tissues.

PRECAUTIONS AGAINST LIQUID CONTACT RISKS

- Avoid splashes on skin or in eyes. Wear chemical goggles or a face shield when handling or working with liquid isocyanates in well-ventilated areas where respiratory protection may not be required.
- In addition to positive-pressure air-supplied masks, wear coveralls, gloves and footwear protection when spraying foam.

(Continued)

FIRST AID

Vapor or Mist Inhalation
Remove persons with exposure symptoms (severe coughing, tightness of chest, labored breathing) from contaminated area immediately. If breathing is labored or difficult, oxygen should be administered by trained personnel. Although highly unlikely even in massive exposures, if breathing has stopped, apply artificial respiration and obtain medical attention immediately.

Liquid Isocyanate Contact
Eyes: Flush eyes with copious quantities of clean water for at least 15 minutes. Obtain medical attention immediately.

Ingestion: Induce vomiting. Call a physician or Poison Control Center.

Skin: If massive contact occurs, as from a major spill, remove contaminated clothing and shoes and flush the body with water from a hose or safety shower. Wipe affected areas with clean cloths saturated with rubbing alcohol. Follow with soap and water washings. For minor contact, wipe off with rubbing alcohol and wash with soap and water. If swelling or reddening occurs, obtain medical attention.

SPILLS:
Spills and vapor from spills can be hazardous. If a major isocyanate spill occurs indoors, evacuate the area immediately. Open doors and windows. Cleanup crews must wear respiratory and eye protection. For any spill:

- Dike spill and cover with oil-absorbent material.
- Neutralize spill with dilute aqueous ammonia detergent solution: (water, 90%/conc. NH_4OH, 8%/liquid detergent, 2%).
- Sweep up and dispose of by any standard method in accordance with good industrial practice and in compliance with environmental protection regulations. (Neutralized material is harmless.) Where permitted, sanitary landfill is recommended.
- Wash down area with aqueous detergent solution.
- For minor spills due to leaking containers, move the leaking containers outdoors and transfer contents to sound containers. Decontaminate spill as above.

DISPOSAL OF EMPTY CONTAINERS AND WASTE

No special precautions are required for disposal of waste polyol resin components or their containers. Waste isocyanate and "empty" isocyanate containers require special handling:

Fill empty drums with water or water-surfactant solution outdoors. DO NOT SEAL OR STOPPER. Sufficient carbon dioxide may be generated to rupture the container. Allow drums to stand outdoors for 48 hours with bung removed. Drain and puncture drum to prevent reuse. Dispose of contents as under SPILLS, above.

Convert waste isocyanate to solids in open containers as SPILLS, above. Do not pour into sewer drains.

Never enter any tank car, tank wagon, holding tank, or any other storage vessel which has contained isocyanate until all safety precautions have been completed. See Upjohn's Technical Bulletin 107, Second Edition, Revised. Appendix E.

FIRE AND EXPLOSION RISKS

In common with all organic substances, isocyanate components will burn if subjected to sufficient heat in the presence of air, but their flash points are so high that they are not considered to be serious fire risks and are classified as Class IIIB Combustible Liquids. However, polyurethanes or polyisocyanurates (particularly foams) can present unreasonable fire risks in certain applications if exposed to a fire source. Once ignited, these foams may burn rapidly and produce intense heat, dense smoke and irritating or toxic gases. Improper mixing of STEPANFOAM components may cause the mixtures to ignite. Some STEPANFOAM components contain volatile blowing agents and excessive heat on closed containers can cause them to rupture, sometimes explosively.

PRECAUTIONS AGAINST FIRE AND EXPLOSION RISKS

- Store STEPANFOAM components indoors in unopened containers at 50 to 85°F (10–29°C) unless otherwise specified. Protect from excessive heat and direct sunlight.
- Calibrate mixing and dispensing equipment to deliver each component within ±2% of the ratio specified for the particular STEPANFOAM system. This accuracy must be maintained for the duration of the run.
- Catch all scrap foam generated during machine start-up in disposable containers and remove to an outside, safe area away from combustible materials.
- Do not smoke or use naked lights, open flames, space heaters or other ignition sources near pouring, frothing or spraying operations.
- Cover polyurethane or polyisocyanurate foam used as wall or ceiling insulation as soon as practicable with a fire-resistive thermal barrier having at least a 15-minute finish rating. If covering is not immediately possible or practicable, post signs that a fire risk exists because of the exposed foam.

- Do not apply foam to the inside surfaces of any flue-like configuration.
- Do not allow combustible trash or scrap foam to accumulate at the job site. Dispose of scrap foam according to good industrial practice and in compliance with environmental protection regulations. Where permitted, sanitary landfill is recommended.
- Apply foam only after all welding, cutting or other hot work has been completed. If hot work must be done after foam has been applied, warn the hot-work trade to:

  Remove foam from the work area to a sufficient extent that heat transmitted from the torch or through the metal will not ignite the foam. Remove all combustible material from vicinity of and immediately below work area, or cover with non-combustible material.

  Post a fire-watcher equipped with a fire extinguisher during and for 30 minutes after hot operations.

  Stop work immediately if foam begins to smoke and remove more foam from the work area.
- If polyurethane or polyisocyanurate foam should ignite, extinguish fire immediately by drenching with water spray from a fire hose. For small fires, use water spray, foam, carbon dioxide or dry chemical extinguishers.
- When extinguishing large polyurethane or polyisocyanurate fires, firefighters should wear self- contained breathing apparatus in addition to the protective turnout clothing normally worn.
- Be aware that terms like "fire-retardant" and "flame-resistant," sometimes used to describe flammability properties do not mean fire safety under all conditions and that small-scale fire tests are NOT INTENDED TO REFLECT RISKS PRESENTED BY THESE OR ANY OTHER MATERIALS UNDER ACTUAL FIRE CONDITIONS.

GENERAL RECOMMENDATIONS

To minimize the potential risks which may arise from use of STEPANFOAM components, the following precautions are recommended:

- Polyurethanes or polyisocyanurates which are to be foamed on site should be applied only by skilled applicators in strict accordance with the material suppliers' recommendations and Material Safety Data Sheets (OSHA Form 20, or equivalent).
- Persons who will work with polyurethane or polyisocyanurate components should undergo screening physical examinations before initially starting such work in order to eliminate hypersensitive individuals and those who have a history of chronic respiratory illness or allergic response. It may be desirable to periodically check workers exposed to isocyanates for systemic effects. Workers developing asthmatic reaction should be removed from further exposure.
- Workers should be instructed concerning isocyanate risks and the precautions to be followed. They should be trained to report promptly to their supervisors all leaks, suspected equipment failures, exposure to isocyanates or symptoms of exposure. The importance of good housekeeping should be emphasized and the need for immediate removal of isocyanates spilled on the skin should be impressed on all workers.
- Safety showers and eyewash fountains or baths should be available in areas where isocyanates are used. Workers should know their locations and proper use.
- Eye protection must be worn by all workers using isocyanates. The necessity for prompt and thorough flushing of the eyes in the event of contact with liquid isocyanate should be stressed to minimize possible injury, since isocyanates can react with moist eye tissue.
- Isocyanate vapor levels at the breathing zone must be kept below the maximum acceptable concentration by adequate engineering control or by personal respiratory protection.
- Workers engaged in spraying polyurethanes or polyisocyanurates, indoors or outdoors, must wear positive-pressure air-supplied face masks or hoods. Do not spray near air-intake vents until airflow is shut down and blocked off.
- Polyurethane or polyisocyanurate components which contain volatile blowing agents should be stored indoors in closed containers at temperatures between 50 to 85°F (10 to 29°C) and must not be exposed to elevated temperatures. Any evident pressure buildup should be cautiously vented before the container, preferably cooled to below 75°F (24°C), is fully opened.
- Isocyanates in closed containers must be protected from contamination with water, alkali, strong bases or atmospheric moisture (use dry nitrogen or dry air pad, −40°F dew point).
- Polyurethane or polyisocyanurate foam must be protected by an acceptable fire resistive thermal barrier and must not be left as an exposed interior finish on walls or ceilings, in concealed spaces such as plenums, above hung ceilings, in attics or crawl spaces or in any horizontal or vertical flue-like configuration.
- Polyurethane or polyisocyanurate foam must be protected from high intensity heat sources such as welding, cutting or plumber's torches and from heat conducted therefrom.
- Polyurethane or polyisocyanurate foam scrap must be kept to a minimum at the job site.
- Smoking, open flames or other ignition sources must be prohibited at the site of any polyurethane or polyisocyanurate application operation.

(Continued)

GENERAL RECOMMENDATIONS *(Continued)*

- When in doubt or in need of further information pertaining to the proper use and application of STEPANFOAM components, CONSULT WITH YOUR STEPAN REPRESENTATIVE.

For more detailed information on precautions for the proper usage of isocyanate and resin components, consult the Upjohn Technical Bulletin 107, Second Edition, Revised, and/or Mobay Chemical Corp. Technical Bulletin MDI 83N.

Stepan Company
Urethane Department
Northfield, Illinois 60093

SAFETY INFORMATION

STEPANFOAM—ISOCYANATE AND RESIN COMPONENTS

4.05 Particle Size -- If the listed substance exists in particulate form during any of the following activities, indicate for each applicable physical state the size and the percentage distribution of the listed substance by activity. Do not include particles ≥10 microns in diameter. Measure the physical state and particle sizes for importing and processing activities at the time you import or begin to process the listed substance. Measure the physical state and particle sizes for manufacturing storage, disposal and transport activities using the final state of the product.

CBI

[ ]

N/A

Physical State		Manufacture	Import	Process	Store	Dispose	Transport
Dust	<1 micron						
	1 to <5 microns						
	5 to <10 microns						
Powder	<1 micron						
	1 to <5 microns						
	5 to <10 microns						
Fiber	<1 micron						
	1 to <5 microns						
	5 to <10 microns						
Aerosol	<1 micron						
	1 to <5 microns						
	5 to <10 microns						

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 5 ENVIRONMENTAL FATE

PART A RATE CONSTANTS AND TRANSFORMATION PRODUCTS

5.01 Indicate the rate constants for the following transformation processes. UK

a. Photolysis:

Absorption spectrum coefficient (peak) .... _____ (1/M cm) at _____ nm

Reaction quantum yield, ϕ ..... _____ at _____ nm

Direct photolysis rate constant, k_p, at ... _____ 1/hr _____ latitude

b. Oxidation constants at 25°C:

For $^1O_2$ (singlet oxygen), k_{ox} ..... _____ 1/M hr

For RO_2 (peroxy radical), k_{ox} ..... _____ 1/M hr

c. Five-day biochemical oxygen demand, BOD_5 ... _____ mg/l

d. Biotransformation rate constant:

For bacterial transformation in water, k_b... _____ 1/hr

Specify culture ..... _____

e. Hydrolysis rate constants:

For base-promoted process, k_B ..... _____ 1/M hr

For acid-promoted process, k_A ..... _____ 1/M hr

For neutral process, k_N ..... _____ 1/hr

f. Chemical reduction rate (specify conditions) _____

_____

g. Other (such as spontaneous degradation) ... _____

_____

[ ] Mark (X) this box if you attach a continuation sheet.

PART B PARTITION COEFFICIENTS

5.02 a. Specify the half-life of the listed substance in the following media. UK

Media	Half-life (specify units)
Groundwater	
Atmosphere	
Surface water	
Soil	

b. Identify the listed substance's known transformation products that have a half-life greater than 24 hours.

CAS No.	Name	Half-life (specify units)	Media
			in
			in
			in
			in

5.03 Specify the octanol-water partition coefficient, K_{ow} ... UK at 25°C

Method of calculation or determination .....

5.04 Specify the soil-water partition coefficient, K_d ..... UK at 25°C

Soil type .....

5.05 Specify the organic carbon-water partition coefficient, K_{oc} ..... UK at 25°C

5.06 Specify the Henry's Law Constant, H ..... UK atm-m^3/mole

[ ] Mark (X) this box if you attach a continuation sheet.

5.07 List the bioconcentration factor (BCF) of the listed substance, the species for which it was determined, and the type of test used in deriving the BCF. UK

Bioconcentration Factor	Species	Test[1]

[1]Use the following codes to designate the type of test:

F = Flowthrough
S = Static

[ ] Mark (X) this box if you attach a continuation sheet.

✓ 6.04 For each market listed below, state the quantity sold and the total sales value of
CBI the listed substance sold or transferred in bulk during the reporting year.

[ ]

Market	Quantity Sold or Transferred (kg/yr)	Total Sales Value ($/yr)
Retail sales		
Distribution -- Wholesalers		
Distribution -- Retailers		
Intra-company transfer		
Repackagers		
Mixture producers		
Article producers		
Other chemical manufacturers or processors		
Exporters		
Other (specify)		
_____		

6.05 Substitutes -- List all known commercially feasible substitutes that you know exist for the listed substance and state the cost of each substitute. A commercially feasible substitute is one which is economically and technologically feasible to use
CBI in your current operation, and which results in a final product with comparable performance in its end uses. UK

[ ]

Substitute	Cost ($/kg)

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 7 MANUFACTURING AND PROCESSING INFORMATION

General Instructions:

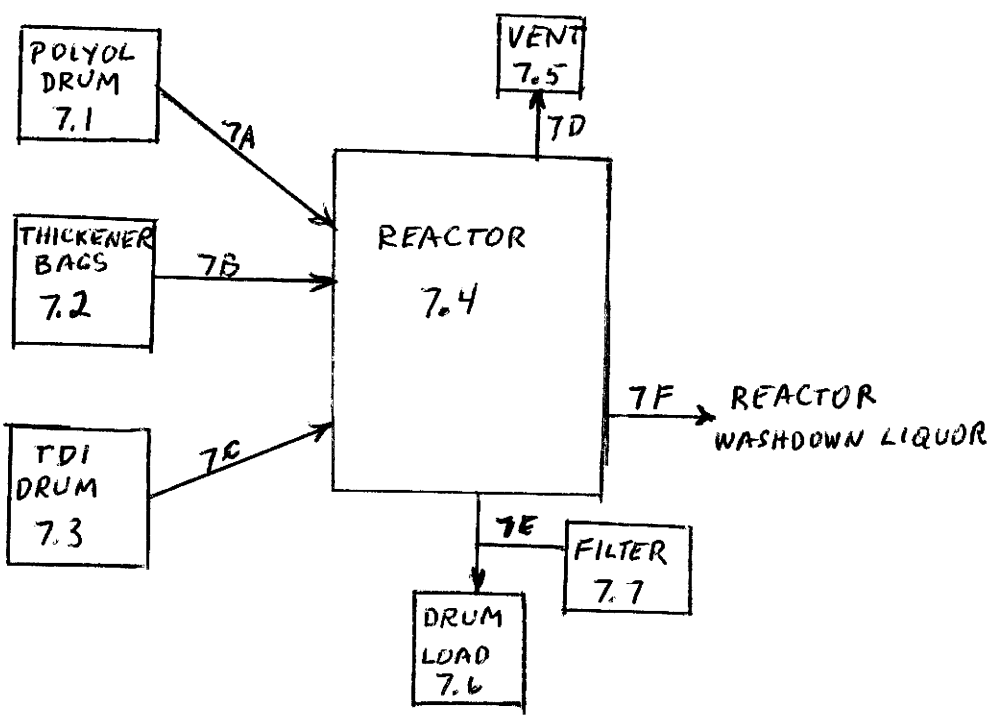
For questions 7.04-7.06, provide a separate response for each process block flow diagram provided in questions 7.01, 7.02, and 7.03. Identify the process type from which the information is extracted.

PART A MANUFACTURING AND PROCESSING PROCESS TYPE DESCRIPTION

7.01 In accordance with the instructions, provide a process block flow diagram showing the major (greatest volume) process type involving the listed substance.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

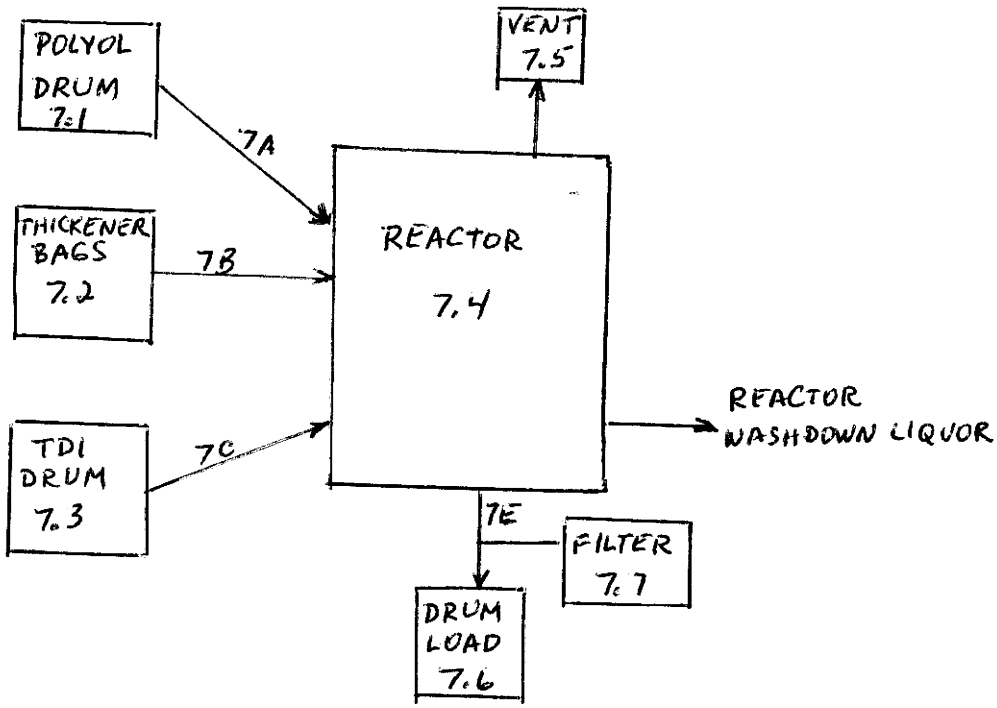


[ ] Mark (X) this box if you attach a continuation sheet.

7.03 In accordance with the instructions, provide a process block flow diagram showing all process emission streams and emission points that contain the listed substance and which, if combined, would total at least 90 percent of all facility emissions if not treated before emission into the environment. If all such emissions are released from one process type, provide a process block flow diagram using the instructions for question 7.01. If all such emissions are released from more than one process type, provide a process block flow diagram showing each process type as a separate block.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS



TDI EMISSIONS

7.5 REACTOR VENT

7.7 FILTER

7.6 DRUM LOADING - OPEN

[ ] Mark (X) this box if you attach a continuation sheet.

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
7.4	REACTOR	65-135	760	S. STEEL
7.7	FILTER	25-30	760-3800	STEEL

[ ] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7A	POLYOL	OL	53537
7B	THICKENER	SO	454
7C	TDI	OL	31009
7E	PREPOLYMER	OL	85000

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[ ] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... PREPOLYMER SYNTHESIS

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7A	POLYOL	100% (A)	N/A	N/A
7B	THICKENER	100% (A)	N/A	N/A
7C	TDI	98+% (A)	N/A	N/A

7.06 continued below

7E	PREPOLYMER	100% (A)	N/A	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

7.06 (continued)

[1]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column b. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.) N/A

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1		
2		
3		
4		
5		

[2]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

[3]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 8 RESIDUAL TREATMENT GENERATION, CHARACTERIZATION, TRANSPORTATION, AND MANAGEMENT

General Instructions:

For questions 8.04-8.06, provide a separate response for each residual treatment block flow diagram provided in question 8.01, 8.02 or 8.03. Identify the process type from which the information is extracted.

For questions 8.05-8.33, the Stream Identification Codes are those process streams listed in either the Section 7 or Section 8 block flow diagrams which contain residuals for each applicable waste management method.

For questions 8.07-8.33, if residuals are combined before they are handled, list those Stream Identification Codes on the same line.

Questions 8.09-8.33 refer to the waste management activities involving the residuals identified in either the Section 7 or Section 8 block flow diagrams. Not all Stream Identification Codes used in the sample answers (e.g., for the incinerator questions) have corresponding process streams identified in the block flow diagram(s). These Stream Identification codes are for illustrative purposes only.

For questions 8.11-8.33, if you have provided the information requested on one of the EPA Office of Solid Waste surveys listed below within the three years prior to your reporting year, you may submit a copy or reasonable facsimile in lieu of answering those questions which the survey addresses. The applicable surveys are: (1) Hazardous Waste Treatment, Storage, Disposal, and Recycling Survey; (2) Hazardous Waste Generator Survey; or (3) Subtitle D Industrial Facility Mail Survey.

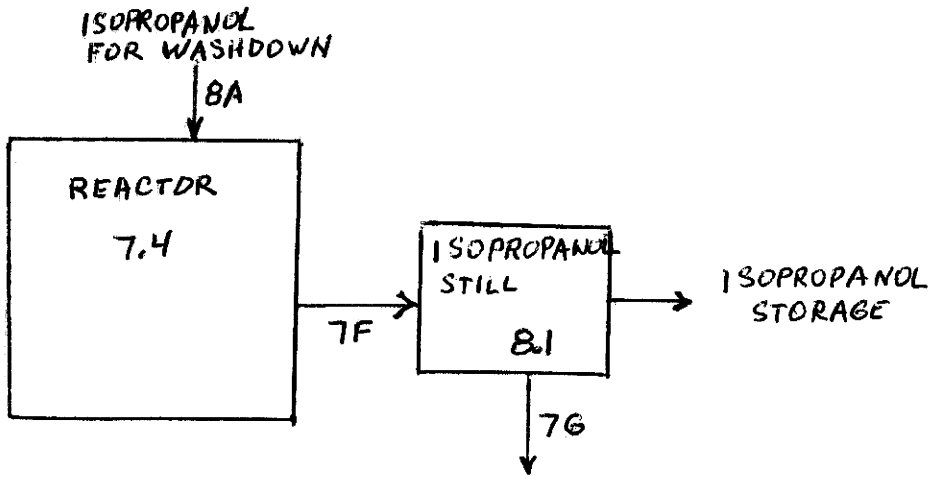
[ ] Mark (X) this box if you attach a continuation sheet.

PART A RESIDUAL TREATMENT PROCESS DESCRIPTION

8.01 In accordance with the instructions, provide a residual treatment block flow diagram which describes the treatment process used for residuals identified in question 7.01.

CBI

[__] Process type ..... PREPOLYMER SYNTHESIS



[__] Mark (X) this box if you attach a continuation sheet.

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

a. Stream ID Code	b. Type of Hazardous Waste[1]	c. Physical State of Residual[2]	d. Known Compounds[3]	e. Concentrations (% or ppm)[4,5,6]	f. Other Expected Compounds	g. Estimated Concentrations (% or ppm)
8A	N/A	N/A	N/A	N/A	N/A	N/A
7G	I(D001)	SY	UREAS	10-20%(E)(W)	UK	UK
			ISOPROPANOL	10-30%(E)(W)	UK	UK
			RESIN	30-70%(E)(W)	UK	UK

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[1]Use the following codes to designate the type of hazardous waste:

I = Ignitable
C = Corrosive
R = Reactive
E = EP toxic
T = Toxic
H = Acutely hazardous

[2]Use the following codes to designate the physical state of the residual:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[3]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column d. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.) N/A

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1		
2		
3		
4		
5		

[4]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[5]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[6]Specify the analytical test methods used and their detection limits in the table below. Assign a code to each test method used and list those codes in column e.

Code	Method	Detection Limit (± ug/l)
1		
2		
3		
4		
5		
6		

[__] Mark (X) this box if you attach a continuation sheet.

8.06 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

a. Stream ID Code	b. Waste Description Code[1]	c. Management Method Code[2]	d. Residual Quantities (kg/yr)	e. Management of Residual (%) On-Site	e. Off-Site	f. Costs for Off-Site Management (per kg)	g. Changes in Management Methods
7G	A03	1FB	1136		100	15.44	NONE

[1]Use the codes provided in Exhibit 8-1 to designate the waste descriptions

[2]Use the codes provided in Exhibit 8-2 to designate the management methods

[ ] Mark (X) this box if you attach a continuation sheet.

8.22 Describe the combustion chamber design parameters for each of the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Incinerator	Combustion Chamber Temperature (°C)		Location of Temperature Monitor		Residence Time In Combustion Chamber (seconds)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
1						
2						
3						

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

8.23 Complete the following table for the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s). N/A

CBI

[ ]

Incinerator	Air Pollution Control Device[1]	Types of Emissions Data Available
1		
2		
3		

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

[1]Use the following codes to designate the air pollution control device:

S = Scrubber (include type of scrubber in parenthesis)
E = Electrostatic precipitator
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

PART A EMPLOYMENT AND POTENTIAL EXPOSURE PROFILE

9.01 Mark (X) the appropriate column to indicate whether your company maintains records on the following data elements for hourly and salaried workers. Specify for each data element the year in which you began maintaining records and the number of years the CBI records for that data element are maintained. (Refer to the instructions for further explanation and an example.)

[ ]

Data Element	Data are Maintained for: Hourly Workers	Salaried Workers	Year in Which Data Collection Began	Number of Years Records Are Maintained
Date of hire	X	X	1955	INDEFINITELY
Age at hire	X	X	1955	INDEFINITELY
Work history of individual before employment at your facility	X	X	1955	INDEFINITELY
Sex	X	X	1955	INDEFINITELY
Race	X	X	1955	INDEFINITELY
Job titles	X	X	PRIOR TO 1980	INDEFINITELY
Start date for each job title	X	N/A	PRIOR TO 1980	INDEFINITELY
End date for each job title	X	N/A	PRIOR TO 1980	N/A
Work area industrial hygiene monitoring data	N/A	N/A	N/A	N/A
Personal employee monitoring data	N/A	N/A	N/A	N/A
Employee medical history	N/A	N/A	N/A	N/A
Employee smoking history	N/A	N/A	N/A	N/A
Accident history	X	X	1955	N/A
Retirement date	X	X	PRIOR TO 1980	N/A
Termination date	X	X	PRIOR TO 1980	N/A
Vital status of retirees	N/A	N/A	N/A	N/A
Cause of death data	N/A	N/A	N/A	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

9.02 In accordance with the instructions, complete the following table for each activity in which you engage.

CBI

[ ]

a. Activity	b. Process Category	c. Yearly Quantity (kg)	d. Total Workers	e. Total Worker-Hours
Manufacture of the listed substance	Enclosed			
	Controlled Release			
	Open			
On-site use as reactant	Enclosed			
	Controlled Release			
	Open			
On-site use as nonreactant	Enclosed			
	Controlled Release			
	Open			
On-site preparation of products	Enclosed			
	* Controlled Release	0.0002	14	157
	Open			

*ESTIMATED FROM LIMITED MONITORING INFORMATION

[ ] Mark (X) this box if you attach a continuation sheet.

9.03 Provide a descriptive job title for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance.

CBI

[ ]

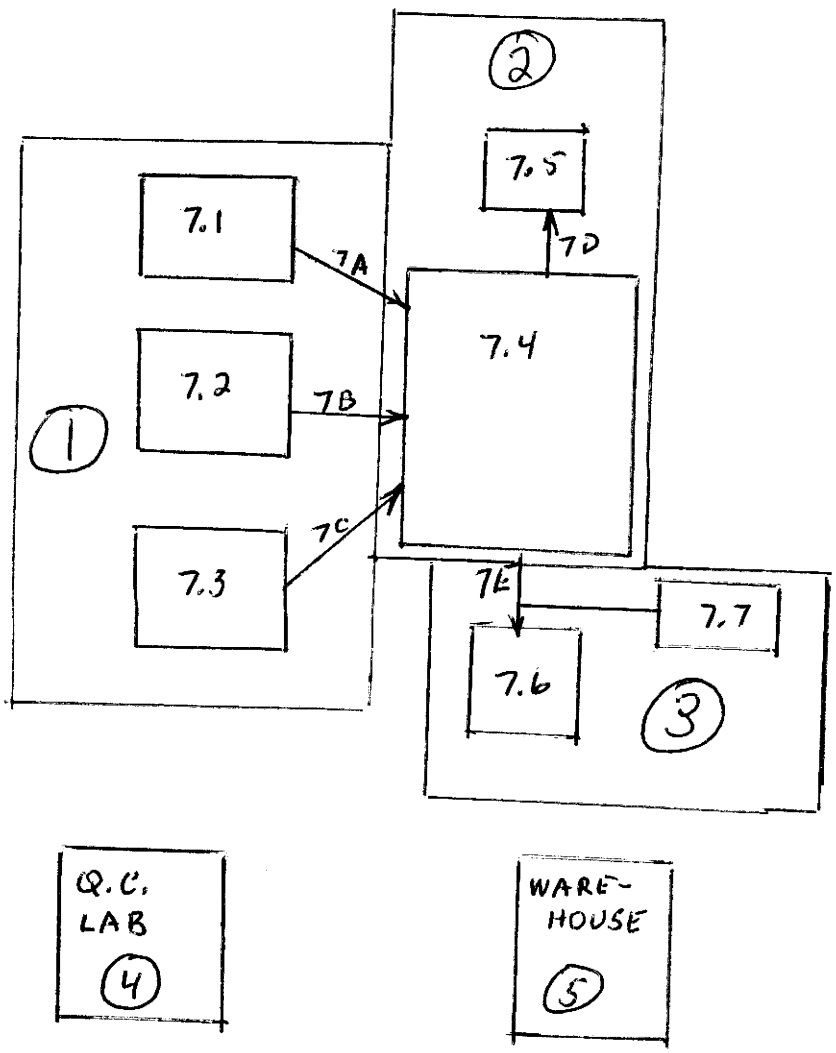
Labor Category	Descriptive Job Title
A	WAREHOUSEMAN
B	REACTOR OPERATOR
C	REACTOR OPERATOR HELPER
D	FOREMAN
E	Q.C. TECHNICIAN
F	
G	
H	
I	
J	

[ ] Mark (X) this box if you attach a continuation sheet.

9.04 In accordance with the instructions, provide your process block flow diagram(s) and indicate associated work areas.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS



[ ] Mark (X) this box if you attach a continuation sheet.

9.05 Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work Area ID	Description of Work Areas and Worker Activities
1	LOADING REACTANTS
2	REACTOR AREA
3	DRUMMING
4	Q. C. LAB
5	WAREHOUSE
6	
7	
8	
9	
10	

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 1

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
B	4	SKIN CONTACT	OL	B	16
C	3	SKIN CONTACT	OL	B	16
D	1	SKIN CONTACT	OL	A	16

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 2

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
B	4	N/A	N/A	N/A	N/A
C	3	N/A	N/A	N/A	N/A
D	1	N/A	N/A	N/A	N/A

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 3

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
B	4	SKIN CONTACT	OL	C	16
C	3	SKIN CONTACT	OL	C	16
D	1	SKIN CONTACT	OL	B	16

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 4

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
E	6	SKIN, INHALATION	OL	A	16

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area ..... 5 (NO EXPOSURE IN THIS AREA)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
A	1	N/A	N/A	N/A	N/A

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 1

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
B	0.002 ppm	UK
C	0.002 ppm	UK
D	0.002 ppm	UK

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 2

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
B	LESS THAN 0.002 ppm	UK
C	LESS THAN 0.002 ppm	UK
D	LESS THAN 0.002 ppm	UK

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 3

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
B	0.002 ppm	UK
C	0.002 ppm	UK
D	0.002 ppm	UK

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 4

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
E	LESS THAN 0.002 ppm	UK

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 5

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
A	NIL	NIL

[ ] Mark (X) this box if you attach a continuation sheet.

PART B WORK PLACE MONITORING PROGRAM

9.08 If you monitor worker exposure to the listed substance, complete the following table.

CBI

[ ]

Sample/Test	Work Area ID	Testing Frequency (per year)	Number of Samples (per test)	Who Samples[1]	Analyzed In-House (Y/N)	Number of Years Records Maintained
Personal breathing zone	1,2,3	1	1	D	Y	N/A
General work area (air)	1,2,3	16	1	D	Y	N/A
Wipe samples	N/A	N/A	N/A	N/A	N/A	N/A
Adhesive patches	N/A	N/A	N/A	N/A	N/A	N/A
Blood samples	N/A	N/A	N/A	N/A	N/A	N/A
Urine samples	N/A	N/A	N/A	N/A	N/A	N/A
Respiratory samples	N/A	N/A	N/A	N/A	N/A	N/A
Allergy tests	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify)						
COMPLETE PHYSICAL	1-5	1	1	N/A	N/A	INDEFINITELY
Other (specify)						
Other (specify)						

[1]Use the following codes to designate who takes the monitoring samples:

A = Plant industrial hygienist
B = Insurance carrier
C = OSHA consultant
D = Other (specify) FOREMAN

[ ] Mark (X) this box if you attach a continuation sheet.

9.09 CBI For each sample type identified in question 9.08, describe the type of sampling and analytical methodology used for each type of sample.

[ ]	Sample Type	Sampling and Analytical Methodology
	GENERAL WORK AREA (AIR)	CHROMATOGRAPHY
	PERSONAL BREATHING ZONE	BADGE DOSIMETER

9.10 If you conduct personal and/or ambient air monitoring for the listed substance, specify the following information for each equipment type used.

CBI

[ ]	Equipment Type[1]	Detection Limit[2]	Manufacturer	Averaging Time (hr)	Model Number
	A	A	MDA	8 HRS.	DUNLOP/I.C.I
	E	A	UK	CONTINUOUS	UK

[1]Use the following codes to designate personal air monitoring equipment types:

A = Passive dosimeter
B = Detector tube
C = Charcoal filtration tube with pump
D = Other (specify) _____

Use the following codes to designate ambient air monitoring equipment types:

E = Stationary monitors located within work area
F = Stationary monitors located within facility
G = Stationary monitors located at plant boundary
H = Mobile monitoring equipment (specify) _____
I = Other (specify) _____

[2]Use the following codes to designate detection limit units:

A = ppm
B = Fibers/cubic centimeter (f/cc)
C = Micrograms/cubic meter (μ/m^3)

[ ] Mark (X) this box if you attach a continuation sheet.

9.11 If you conduct routine medical tests for monitoring the health effects of exposure to the listed substance, specify the type and frequency of the tests. N/A

CBI

[ ]	Test Description	Frequency (weekly, monthly, yearly, etc.)

[ ] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 1, 2, 3

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1973	N	N/A
General dilution	Y	1973	Y	1977
Other (specify)				
Vessel emission controls				
Mechanical loading or packaging equipment				
Other (specify)				

[ ] Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 1

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
REDUCED USE OF TDI	75

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 1

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	N
Face shields	Y
Coveralls	N
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	
FULL FACE MASK	Y
INDEPENDENT AIR SUPPLY	Y

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 2

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	N
Face shields	Y
Coveralls	N
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	
FULL FACE MASK	Y
INDEPENDENT AIR SUPPLY	Y

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 3

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	N
Face shields	Y
Coveralls	N
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	
FULL FACE MASK	Y
INDEPENDENT AIR SUPPLY	Y

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 4

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	Y
Face shields	N
Coveralls	N
Bib aprons	N
Chemical-resistant gloves	N
Other (specify)	
FUME HOODS	Y

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Work area 5

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	Y
Face shields	N
Coveralls	Y
Bib aprons	N
Chemical-resistant gloves	N
Other (specify)	
_____	_____
_____	_____

[ ] Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type. N/A

CBI

[ ] Process type ..... _____

Work Area	Respirator Type	Average Usage[1]	Fit Tested (Y/N)	Type of Fit Test[2]	Frequency of Fit Tests (per year)

[1]Use the following codes to designate average usage:

A = Daily
B = Weekly
C = Monthly
D = Once a year
E = Other (specify) _____

[2]Use the following codes to designate the type of fit test:

QL = Qualitative
QT = Quantitative

[ ] Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

[ ]

Process type ..... PREPOLYMER SYNTHESIS

Work area 1,2,3

RESTRICT ENTRANCE TO AUTHORIZED WORKERS

MONITOR WORK PRACTICES

PROVIDE WORKER TRAINING

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type .....

Work area .....

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping				
Vacuuming				
Water flushing of floors				
Other (specify)				
AMMONIA/WATER WASH ON FLOOR	X			

[ ] Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

No 2

Emergency exposure

Yes 1

No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: _____

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes ..... (1)

No 2

If yes, where are copies of the plan maintained? _____

Has this plan been coordinated with state or local government response organizations? Circle the appropriate response.

Yes ..... (1)

No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

Plant safety specialist 1

Insurance carrier 2

OSHA consultant 3

Other (specify) _____ 4

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 10 ENVIRONMENTAL RELEASE

General Instructions:

Complete Part E (questions 10.23-10.35) for each non-routine release involving the listed substance that occurred during the reporting year. Report on all releases that are equal to or greater than the listed substance's reportable quantity value, RQ, unless the release is federally permitted as defined in 42 U.S.C. 9601, or is specifically excluded under the definition of release as defined in 40 CFR 302.3(22). Reportable quantities are codified in 40 CFR Part 302. If the listed substance is not a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and, thus, does not have an RQ, then report releases that exceed 2,270 kg. If such a substance however, is designated as a CERCLA hazardous substance, then report those releases that are equal to or greater than the RQ. The facility may have answered these questions or similar questions under the Agency's Accidental Release Information Program and may already have this information readily available. Assign a number to each release and use this number throughout this part to identify the release. Releases over more than a 24-hour period are not single releases, i.e., the release of a chemical substance equal to or greater than an RQ must be reported as a separate release for each 24-hour period the release exceeds the RQ.

For questions 10.25-10.35, answer the questions for each release identified in question 10.23. Photocopy these questions and complete them separately for each release.

PART A GENERAL INFORMATION

10.01 Where is your facility located? Circle all appropriate responses.

CBI

[ ] Industrial area ..... (1)

Urban area 2

Residential area 3

Agricultural area ..... (4)

Rural area ..... (5)

Adjacent to a park or a recreational area 6

Within 1 mile of a navigable waterway ..... (7)

Within 1 mile of a school, university, hospital, or nursing home facility 8

Within 1 mile of a non-navigable waterway ..... (9)

Other (specify) _____ 10

[ ] Mark (X) this box if you attach a continuation sheet.

10.02 Specify the exact location of your facility (from central point where process unit is located) in terms of latitude and longitude or Universal Transverse Mercader (UTM) coordinates.

Latitude ..... 41 ° 27 ' 10 "

Longitude ..... 88 ° 10 ' 00 "

UTM coordinates ..... Zone _____, Northing _____, Easting _____

10.03 If you monitor meteorological conditions in the vicinity of your facility, provide the following information.

Average annual precipitation ..... _____ inches/year

Predominant wind direction ..... _____

10.04 Indicate the depth to groundwater below your facility.

Depth to groundwater ..... _____ meters

10.05 For each on-site activity listed, indicate (Y/N/NA) all routine releases of the listed substance to the environment. (Refer to the instructions for a definition of Y, N, and NA.)

CBI

[ ]

On-Site Activity	Environmental Release		
	Air	Water	Land
Manufacturing			
Importing			
Processing	Y	N/A	N/A
Otherwise used			
Product or residual storage			
Disposal			
Transport			

[ ] Mark (X) this box if you attach a continuation sheet.

10.06 Provide the following information for the listed substance and specify the level of precision for each item. (Refer to the instructions for further explanation and an example.)

CBI

[ ]

* Quantity discharged to the air	0.0002	kg/yr ± 20	%
Quantity discharged in wastewaters	N/A	kg/yr ± ___	%
Quantity managed as other waste in on-site treatment, storage, or disposal units	N/A	kg/yr ± ___	%
Quantity managed as other waste in off-site treatment, storage, or disposal units	N/A	kg/yr ± ___	%

*ESTIMATE BASED ON LIMITED MONITORING INFORMATION

[ ] Mark (X) this box if you attach a continuation sheet.

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Stream ID Code	Control Technology	Percent Efficiency

DO NOT USE CONTROL TECHNOLOGY. RELEASE TDI TO ATMOSPHERE.

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

10.09 Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

CBI
[ ]

Process type ..... PREPOLYMER SYNTHESIS

Point Source ID Code	Description of Emission Point Source
7D	REACTOR VENT
7E	DRUM LOADING

[ ] Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ]

	Point Source ID Code	Physical State[1]	Average Emissions (kg/day)	Frequency[2] (days/yr)	Duration[3] (min/day)	Average Emission Factor[4]	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
*	7D	V	.000006	16	1440	.00000001	.000000005	16	1440
*	7E	V	.000006	16	180	.00000001	.00000007	16	180

[1]Use the following codes to designate physical state at the point of release:
G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

[2]Frequency of emission at any level of emission

[3]Duration of emission at any level of emission

[4]Average Emission Factor — Provide estimated (± 25 percent) emission factor (kg of emission per kg of production of listed substance)

*ESTIMATE FROM LIMITED MONITORING INFORMATION

[ ] Mark (X) this box if you attach a continuation sheet.

10.11 Stack Parameters -- Identify the stack parameters for each Point Source ID Code identified in question 10.09 by completing the following table. UK

CBI

[ ]

Point Source ID Code	Stack Height(m)	Stack Inner Diameter (at outlet) (m)	Exhaust Temperature (°C)	Emission Exit Velocity (m/sec)	Building Height(m)[1]	Building Width(m)[2]	Vent Type[3]

[1]Height of attached or adjacent building

[2]Width of attached or adjacent building

[3]Use the following codes to designate vent type:

H = Horizontal
V = Vertical

[ ] Mark (X) this box if you attach a continuation sheet.

10.12 If the listed substance is emitted in particulate form, indicate the particle size distribution for each Point Source ID Code identified in question 10.09. Photocopy this question and complete it separately for each emission point source.

CBI

[ ]

N/A

Point source ID code ..... _____

Size Range (microns)	Mass Fraction (% ± % precision)
< 1	
≥ 1 to < 10	
≥ 10 to < 30	
≥ 30 to < 50	
≥ 50 to < 100	
≥ 100 to < 500	
≥ 500	

Total = 100%

[ ] Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... PREPOLYMER SYNTHESIS

Percentage of time per year that the listed substance is exposed to this process type ..... 5.5 %

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					
	Less than 5%	5-10%	11-25%	26-75%	76-99%	Greater than 99%
Pump seals[1]						
Packed						
Mechanical						
Double mechanical[2]						
Compressor seals[1]						
Flanges				X		
Valves						
Gas[3]						
Liquid				X		
Pressure relief devices[4] (Gas or vapor only)						
Sample connections						
Gas						
Liquid				X		
Open-ended lines[5] (e.g., purge, vent)						
Gas	X					
Liquid				X		

[1]List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

[ ] Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

[2]If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

[3]Conditions existing in the valve during normal operation

[4]Report all pressure relief devices in service, including those equipped with control devices

[5]Lines closed during normal operation that would be used during maintenance operations

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c. N/A

CBI

[ ]

a. Number of Pressure Relief Devices	b. Percent Chemical in Vessel[1]	c. Control Device	d. Estimated Control Efficiency[2]

[1]Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

[2]The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

[ ] Mark (X) this box if you attach a continuation sheet.

10.15 Equipment Leak Detection -- If a formal leak detection and repair program is in place, complete the following table regarding those leak detection and repair procedures. Photocopy this question and complete it separately for each process type.

CBI N/A

[ ] Process type ..... _____

Equipment Type	Leak Detection Concentration (ppm or mg/m^3) Measured at ____ Inches from Source	Detection Device[1]	Frequency of Leak Detection (per year)	Repairs Initiated (days after detection)	Repairs Completed (days after initiated)
Pump seals					
Packed					
Mechanical					
Double mechanical					
Compressor seals					
Flanges					
Valves					
Gas					
Liquid					
Pressure relief devices (gas or vapor only)					
Sample connections					
Gas					
Liquid					
Open-ended lines					
Gas					
Liquid					

[1]Use the following codes to designate detection device:

POVA = Portable organic vapor analyzer
FPM = Fixed point monitoring
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

[ ] Mark (X) this box if you attach a continuation sheet.

10.16 Raw Material, Intermediate and Product Storage Emissions - - Complete the following table by providing the information on each liquid raw material, intermediate, and product storage vessel containing the listed substance as identified in your process block or residual treatment block flow diagram(s). N/A

CBI

[ ]

Vessel Type[1]	Floating Roof Seals[2]	Composition of Stored Materials[3]	Throughput (liters per year)	Vessel Filling Rate (gpm)	Vessel Filling Duration (min)	Vessel Inner Diameter (m)	Vessel Height (m)	Operating Vessel Volume (l)	Vessel Emission Controls[4]	Design Flow Rate[5]	Vent Diameter (cm)	Control Efficiency (%)	Basis for Estimate[6]

[1]Use the following codes to designate vessel type:

F = Fixed roof
CIF = Contact internal floating roof
NCIF = Noncontact internal floating roof
EFR = External floating roof
P = Pressure vessel (indicate pressure rating)
H = Horizontal
U = Underground

[2]Use the following codes to designate floating roof seals:

MS1 = Mechanical shoe, primary
MS2 = Shoe-mounted secondary
MS2R = Rim-mounted, secondary
LM1 = Liquid-mounted resilient filled seal, primary
LM2 = Rim-mounted shield
LMW = Weather shield
VM1 = Vapor mounted resilient filled seal, primary
VM2 = Rim-mounted secondary
VMW = Weather shield

[3]Indicate weight percent of the listed substance. Include the total volatile organic content in parenthesis

[4]Other than floating roofs

[5]Gas/vapor flow rate the emission control device was designed to handle (specify flow rate units)

[6]Use the following codes to designate basis for estimate of control efficiency:

C = Calculations
S = Sampling

PART E NON-ROUTINE RELEASES

10.23 Indicate the date and time when the release occurred and when the release ceased or was stopped. If there were more than six releases, attach a continuation sheet and list all releases. N/A

Release	Date Started	Time (am/pm)	Date Stopped	Time (am/pm)
1				
2				
3				
4				
5				
6				

10.24 Specify the weather conditions at the time of each release.

Release	Wind Speed (km/hr)	Wind Direction	Humidity (%)	Temperature (°C)	Precipitation (Y/N)
1					
2					
3					
4					
5					
6					

[ ] Mark (X) this box if you attach a continuation sheet.